Manitoba
Energy and Mines
Mines Branch

Aggregate Report AR89-4

Aggregate Resource Inventory of the Rural Municipality of Lorne

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Map AR89-4: Aggregate Resources in The Rural Municipality of Lorne . . . . . in pocket

ABSTRACT

An aggregate resource inventory was carried out in the Rural Municipality of Lorne. Airphoto interpretation, followed by field investigations, was used to identify and define sand and gravel deposits. A total of 57 sand and gravel deposits were identified including 38 sand and gravel pits, in addition, 22 shale bedrock quarries were identified as potential sources of aggregate. Estimated reserves are in excess of 124 million cubic metres. The sand and gravel is characterized by a high shale content.

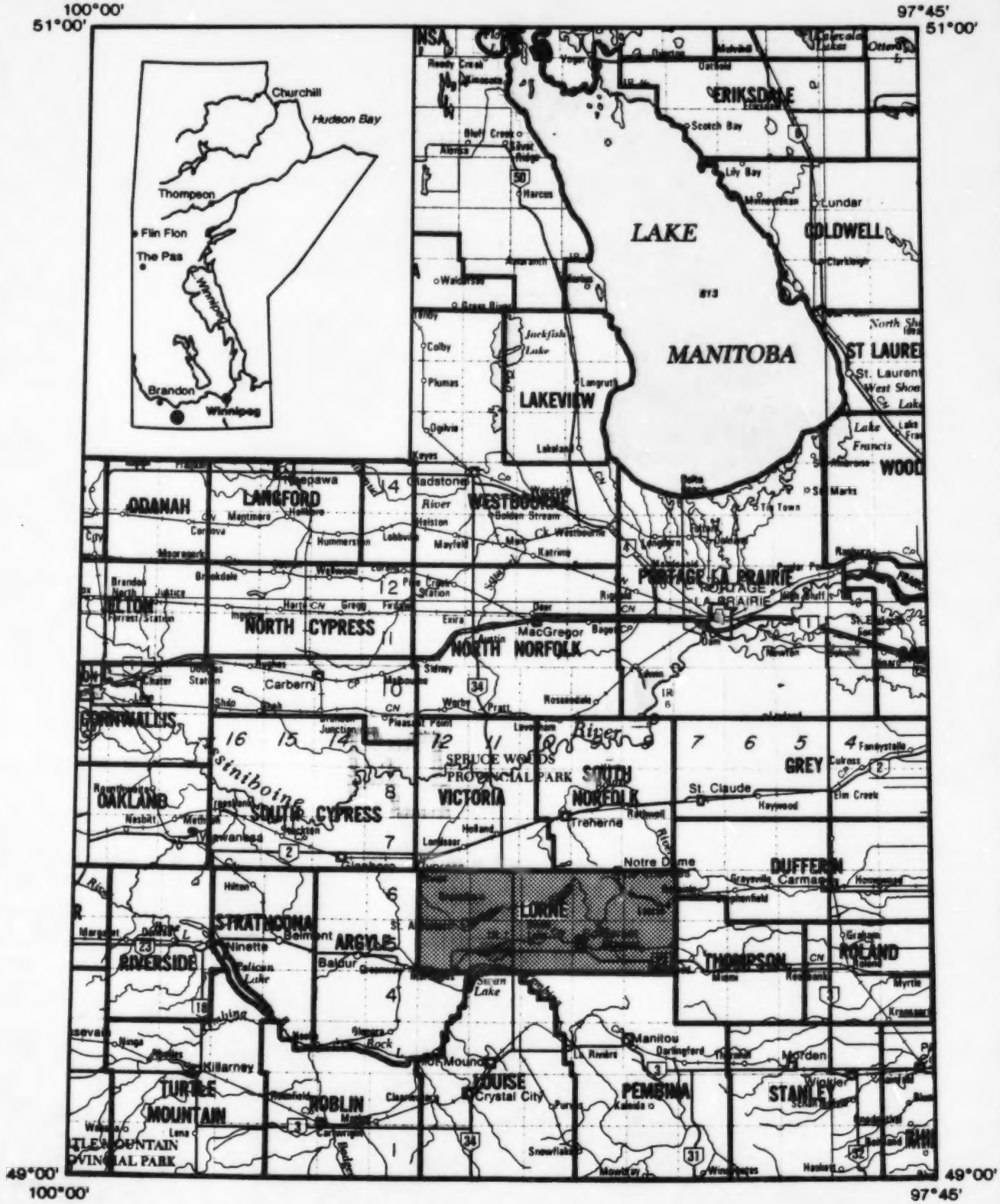


Figure 1: Location of The Rural Municipality of Lorne

INTRODUCTION

OBJECTIVES

An aggregate resource inventory was carried out in the Rural Municipality of Lorne, with the objective of determining the location, quality, and reserves of aggregate resources. The information contained within this report may be used to assist in land-use planning, resource management, and by consumers of sand and gravel.

LOCATION AND ACCESS

The study area (Fig. 1) encompasses 921 square kilometres located 128 kilometres southwest of Winnipeg. The Municipality includes Townships 5-6 and Ranges 8-12 west of Principal Meridian. The largest settlements are the towns of Somerset and Swan Lake. Access is by Provincial Highways 23 and 34 and several provincial roads.

METHODOLOGY

Geological field investigations were conducted during the summers of 1988 and 1989. Airphotos at scales of 1:56 000 and 1:15 840 were used to identify potential aggregate deposits. Existing sand and gravel pits were examined and sampled, and undeveloped and potential deposits were tested by backhoe to a maximum depth of 4 m. A total of 54 sites were tested by backhoe.

The coarse aggregate sample fraction (19.1 - 76.3 mm) was sieved in the field and weights recorded. Clast sizes greater than 76.3 mm (3") were recorded as sparse, moderate or abundant. A representative sample of the less than 19.1 mm size range was retained and sieved in the laboratory. Sizes less than 0.074 mm were recorded as combined silt/clay fraction. A total of 42 samples were analyzed.

The field sieved coarse aggregate was used to perform the petrographic analysis when sufficient sample size was available. Each clast was classified according to rock type and the number of clasts for each rock type was counted. Rock types were grouped into four categories: good, fair, poor and deleterious according to their suitability as aggregate. The percent shale by weight was also calculated for the coarse fraction. In addition, for selected samples, the percent shale by weight was also calculated for the 4.76 - 9.5 mm size.

Reserve estimates were calculated by multiplying deposit depth by deposit area, and adjusting the reserves for areas depleted or not available for mining. Total reserves within the study area are 124 million cubic metres, although 89 million cubic metres are within a sandy outwash plain.

ACKNOWLEDGEMENTS

Able field and laboratory assistance was provided by Gerald Olsen. Maps and figures were drafted by M. Carvalho under the direction of E. Truman. Mineral ownership data for the municipality was provided by The Crown Lands Branch.

AGGREGATE RESOURCES

A total of 38 sand and gravel pits and 22 shale bedrock quarries have been identified within the study area, although not all are active. Sand and gravel deposits consist of Lake Agassiz beaches, glaciofluvial deposits, and outwash associated with meltwater channels and the Darlingford Moraine. A total of 57 deposits have been identified, including 8 assumed deposits with undefined boundaries.

Estimated reserves are in excess of 124 million cubic metres with an estimated 96.7 million cubic metres of fine sand.

All exposure and deposit information is provided in Appendix A. This information includes deposit reserves, exposure data, sieve analysis and petrographic analysis. Location of deposits, exposures and backhoe test sites are shown on Map AR89-4 that accompanies this report.

REFERENCES

Manitoba Department of Highways and Transportation

1977: Aggregate Resource Inventory Block File 17 and 18, Geotechnical Section, Materials and Research Division.

APPENDIX A: EXPOSURE DATA

DEPOSIT #011901

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-07-006-12W	225000	30	157500	PRIVATE/PRIVATE	
SE-07-006-12W	51000	0	51000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		208500		

EXPOSURE INFORMATION

EXPOSURE #: RY361 (NE-07-006-12W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT NOT IN USE
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 5.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND
SECTION HEIGHT: 5.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 5.0 M. THICKNESS OF OVERBURDEN: 1.0 M.
MATERIAL AT BASE: SAND
SEE SEIVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
SMALL PIT, 1000 CUBIC METRES REMOVED, OCCASIONAL COARSE SAND BED, SAMPLE OF FINE SAND ONLY, NO PEBBLE COUNT.
0.0-3.0 M. PEBBLY SILT.
3.0-5.0 M. FINE-MEDIUM SAND.

SIEVE ANALYSIS

		PERCENT PASSING										
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NE-07-006-12W RY361 A		100	100	100	100	100	100	99	93	63	26	14	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

DEPOSIT #011902

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-04-006-12W	20000	0	20000	PRIVATE/PRIVATE	
NE-05-006-12W	125000	0	125000	PRIVATE/PRIVATE	
SE-08-006-12W	150000	20	120000	PRIVATE/PRIVATE	
SW-09-006-12W	4000	0	4000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		269000		

EXPOSURE INFORMATION

EXPOSURE #: RY359 (SE-08-006-12W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT USED TEMPORARILY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 6.0 METRES QUALITY: MEDIUM LOW
SECTION: A MATERIAL DESCRIPTION: SANDY GRAVEL
SECTION HEIGHT: 6.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 3.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND AND GRAVEL
SEE SEIVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION:
NORTH END OF PIT FINE TO COARSE SAND, SOUTH END MASSIVE GRAVEL, SANDY WITH HIGH SILT, 3000 CUBIC METRES REMOVED, PIT ENCROACHES ONTO ROAD ALLOWANCE.

GENERAL STRATIGRAPHY:
0.0-2.0 M. SILTY SAND
2.0-6.0 M. MASSIVE SAND AND GRAVEL.

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SE-08-006-12W RY359 A		100	99	92	70	51	36	26	20	15	10	9	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY359	60	0	7	33	13	

DEPOSIT #011903

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
SE-15-006-12W	60000	5	57000	PRIVATE/PRIVATE	
SW-15-006-12W	42000	0	42000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		99000		

EXPOSURE INFORMATION

EXPOSURE #: RY362 (SE-15-006-12W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT NOT IN USE
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 2.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLY SAND
SECTION HEIGHT: 5.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 3.0 M.
MATERIAL AT BASE: SAND AND GRAVEL
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
SMALL BORROW PIT, 300 CUBIC METRES 0.0-3.0 M. SILT
REMOVED, BEDDED PEBBLY SAND 3.0-5.0 M. PEBBLY SAND
OVERLAIN BY 3 M. SILT, UNECONOMIC.

DEPOSIT #011904

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-26-006-12W	16000	20	12800	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		12800		

EXPOSURE INFORMATION

EXPOSURE #: RY365 (NE-26-006-12W)VISITED:89
EXPOSURE TYPE: BORROW PIT LAND USE: PIT USED TEMPORARILY
SURROUNDING LAND USE: PASTURE,GRAZING
ECONOMIC THICKNESS: 0.5 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: GRAVEL
SECTION HEIGHT: DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE:
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
BORROW PIT AND DUGOUT, 50 CU. M. 0.0-0.5 M. GRAVEL
REMOVED, FARMER SAYS USED FOR 0.5-1.5 M. SILTY TILL
MUNICIPAL ROAD BY MUNICIPALITY, 1.5-2.5 M. FINE SAND
UNECONOMIC.

DEPOSIT #011905

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-11-006-12W	210000	5	199500	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		199500		

EXPOSURE INFORMATION

EXPOSURE #: RY364 (NE-11-006-12W)VISITED:89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: MEDIUM
SECTION: A MATERIAL DESCRIPTION: PEBBLE GRAVEL
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 4.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND AND GRAVEL
SEE SEIVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
10,000 CU. M. REMOVED, HIGH SHALE 0.0-4.0 M. PEBBLE GRAVEL

SIEVE ANALYSIS

		PERCENT PASSING										
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NE-11-006-12W RY364 A		100	99	91	78	62	51	40	28	19	14	13	SPARSE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY364	6	1	0	94	94	SHALE 4.7-9.5 MM.=78%

DEPOSIT #011906

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
SE-31-005-12W	12500	0	12500	PRIVATE/PRIVATE	
SW-32-005-12W	240000	5	228000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		240500		

EXPOSURE INFORMATION

EXPOSURE #: BB011 (SW-32-005-12W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: PIT-TEMPORARY USE
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: B MATERIAL DESCRIPTION: PEBBLE SAND
SECTION HEIGHT: DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE:
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
BOTTOM OF PIT AT RY354, EXISTING PIT 0.0-2.0 M. PEBBLE SAND EXISTING PIT
2.0 M. PEBBLE SAND, DEPOSIT MASSIVE 2.0-4.0 M. BACKHOE TEST PIT
AND COARSER WITH DEPTH, COBBLES COARSE PEBBLES AND COBBLES, WET.
ALL 100% SHALE.

EXPOSURE #: BB012 (SE-31-005-12W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 2.5 METRES QUALITY: MEDIUM LOW
SECTION: A MATERIAL DESCRIPTION: SAND OVER PEBBLE GRAVEL
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 3.0 M. THICKNESS OF OVERBURDEN: 1.5 M.
MATERIAL AT BASE: SAND AND GRAVEL
SEE SEIVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
0.0-1.5 M. SOIL
1.5-2.5 M. FINE AND MEDIUM SAND
2.5-4.0 M. COBBLY PEBBLE GRAVEL, DRY

EXPOSURE #: RY354 (SW-32-005-12W) VISITED: 88
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-NOT IN USE (COMMONLY REVEGETATED)
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 2.5 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLE SAND
SECTION HEIGHT: 2.5 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 2.5 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: BEDROCK
SEE SEIVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
PEBBLE COUNT- 75 LIMESTONE, 50 SHALE, 0.0-0.5 M. TOPSOIL
AND 7 PRECAMBRIAN 0.5-2.5 M. HORIZONTAL BEDDED TO MASSIVE PEBBLE SAND
2.5 SHALE BEDROCK

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SW-31-005-12W BB012 A		96	91	78	64	51	40	30	24	19	15	13	NONE
SW-32-005-12W RY354 A		100	96	87	76	63	54	45	37	25	14	8	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
BB012	8	55	0	37	20	SHALE4.7-9.5 MM.=62%

DEPOSIT #011907

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-35-005-12W	85500	20	68400	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		68400		

EXPOSURE INFORMATION

EXPOSURE #: RY355 (NW-35-005-12W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: PASTURE,GRAZING
ECONOMIC THICKNESS: 1.5 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLY SAND
SECTION HEIGHT: 1.5 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 1.5 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE:
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
PIT PARTIALLY OVERGROWN, 500 CU.M.
REMOVED, HIGH SHALE CONTENT.

SIEVE ANALYSIS

		PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NW-35-005-12W RY355 A		100	100	98	88	78	70	61	50	34	22	16	SPARSE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY355	35	4	5	56	52	SHALE 4.7-9.5 MM.=55%

DEPOSIT #011908

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
SE-35-005-12W	60000	0	60000	PRIVATE/PRIVATE	
SW-36-005-12W	120000	0	120000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		180000		

EXPOSURE INFORMATION

EXPOSURE #: BB006 (SW-36-005-12W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 3.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
BACKHOE AT TOP OF EAST-WEST 0.0-0.5 M. SOIL
TRENDING RIDGE, 15 cm. PEBBLE BED 1.0-4.0 M. FINE SAND, OCCASIONAL PEBBLE, MASSIVE
AT 3.5 M. 0.5-1.0 M. SILT

SIEVE ANALYSIS

		PERCENT PASSING										
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SW-36-005-12W BB006 A		100	100	100	99	98	95	91	84	68	41	29	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

DEPOSIT #011909

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-10-005-12W	50000	0	50000	PRIVATE/PRIVATE	
SW-15-005-12W	180000	30	126000	PRIVATE/PRIVATE	
SE-16-005-12W	60000	0	60000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		236000		

EXPOSURE INFORMATION

EXPOSURE #: BB004 (NW-10-005-12W)
EXPOSURE TYPE: BACKHOE TEST PIT
ECONOMIC THICKNESS: 2.5 METRES
SECTION: B MATERIAL DESCRIPTION: COBBLY COARSE PEBBLE GRAVEL
SECTION HEIGHT: 4.0 M.
HEIGHT SAMPLED: 2.5 M.
MATERIAL AT BASE: SAND AND GRAVEL
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION:
NO PEBBLE LITHOLOGY DONE AS 3/4 IN.
WAS 100% SHALE

VISITED: 89
LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
QUALITY: MEDIUM LOW
DEPTH TO WATER TABLE:
THICKNESS OF OVERBURDEN : 1.5 M.
GENERAL STRATIGRAPHY:
0.0-1.5 M. FINE SAND AND SILT
1.5-4.0 M. COBBLY COARSE PEBBLE GRAVEL, HIGH SHALE CONTENT

SIEVE ANALYSIS

		PERCENT PASSING										
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NW-10-005-12W BB004		100	95	81	75	67	56	43	33	26	21	18	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

DEPOSIT #011910

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-03-005-12W	45000	0	45000	PRIVATE/PRIVATE	
NE-04-005-12W	60000	60	24000	PRIVATE/PRIVATE	
SE-04-005-12W	120000	0	120000	PRIVATE/PRIVATE	
SW-04-005-12W	320000	0	320000	PRIVATE/PRIVATE	
SE-05-005-12W	24000	0	24000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		533000		

EXPOSURE INFORMATION

EXPOSURE #: BB001 (NW-03-005-12W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 3.0 METRES QUALITY: MEDIUM LOW
SECTION: B MATERIAL DESCRIPTION: PEBBLE GRAVEL
SECTION HEIGHT: 3.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 3.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: TILL
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
TEST PIT ACROSS FROM FARM 0.0-3.0 M. PEBBLE GRAVEL, HIGH SHALE CONTENT
3.0-4.0 M. TILL

EXPOSURE #: RY346 (SW-04-005-12W) VISITED: 89
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: AGRICULTURE,HAYING
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLE SAND
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 3.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
HORIZONTAL BEDDED

SIEVE ANALYSIS

		PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NW-03-005-12W BB001 B		100	99	96	83	71	59	49	38	28	22	20	NONE
SW-04-005-12W RY346 A		100	100	98	92	82	65	42	23	12	8	7	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
BB001	16	6	0	78	40	SHALE 4.7-9.5 MM.=77%

DEPOSIT #011911

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-25-006-11W	180000	30	126000	PRIVATE/PRIVATE	
SE-36-006-11W	24000	30	16800	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		142800		

EXPOSURE INFORMATION

EXPOSURE #: RY369 (NE-25-006-11W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT NOT IN USE
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 6.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLEY SAND
SECTION HEIGHT: 6.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 1.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND AND GRAVEL
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION:
500 CU. M. REMOVED PIT PARTIALLY OVERGROWN, TOP 1.0 M. ECONOMIC SAND FOR FARM USE ACCORDING TO FARMER.

GENERAL STRATIGRAPHY:
0.0-1.0 M. PEBBLY SAND, BEDDED TO MASSIVE
1.0-6.0 M. FINE SAND,BEDDED

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NE-25-006-11W RY369 A		100	100	95	81	65	46	31	22	16	13	12	SPARSE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY369	52	5	0	43	30	SHALE 4.7-9.5 MM.=40%

DEPOSIT #011912

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-15-006-11W	160000	0	160000	PRIVATE/PRIVATE	
SW-15-006-11W	245000	40	147000	PRIVATE/PRIVATE	
jSE-16-006-11W	32000	0	32000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		339000		

EXPOSURE INFORMATION

EXPOSURE #: BB017 (SW-15-006-11W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 7.5 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND PEBBLE FREE
SECTION HEIGHT: 7.5 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 5.5 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
ROADCUT ON CREST OF RIDGE, COARSE SAND OVERLYING SILTY FINE SAND OVERLYING VERY FINE SAND.
0.0-2.0 M. SHALE RICH COARSE SAND ON ROADCUT
2.0-3.0 M. BACKHOESILTY FINE SAND
3.0-5.5 M. FINE SAND, PEBBLE FREE, BEDDED

EXPOSURE #: RY440 (SW-15-006-11W) VISITED: 89
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: AGRICULTURE,HAYING
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: VERY COARSE SAND
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SW-15-006-11W BB017		100	100	100	100	100	99	99	97	83	37	19	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

DEPOSIT #011913 (ASSUMED DEPOSIT)

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
SE-16-006-11W	37000	0	37000	PRIVATE/PRIVATE	
SW-16-006-11W	40000	95	2000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		39000		

DEPOSIT #011914

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-08-006-11W	200000	0	200000	PRIVATE/PRIVATE	
NW-09-006-11W	300000	20	240000	PRIVATE/PRIVATE	
SW-16-006-11W	51000	0	51000	PRIVATE/PRIVATE	
DEPOSIT RESERVES	491000				

EXPOSURE INFORMATION

EXPOSURE #: RY374 (NW-09-006-11W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 5.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLY SAND AND SAND
SECTION HEIGHT: 5.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 5.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND AND GRAVEL
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
ESKER DEPOSIT, BEDDED SAND WITH BEDS OF PEBBLES, 7000 CU. M. REMOVED, ACTIVE PIT, PIT 80 M.X 60 M., 0.0-5.0 M. PEBBLE SAND, SHALE RICH SOUTH END OF PIT IS SAND; NORTH END OF PIT IS PEBBLY COARSE SAND

SIEVE ANALYSIS

		PERCENT PASSING										
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NW-09-006-11W RY374 A		100	99	95	94	87	79	71	60	48	37	29	SPARSE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY374	21	2	0	78	50	SHALE 4.7-9.5 MM.=N/A

DEPOSIT #011915

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-09-006-11W	7000	0	7000	PRIVATE/PRIVATE	
SE-16-006-11W	129500	0	129500	PRIVATE/PRIVATE	
DEPOSIT RESERVES			136500		

EXPOSURE INFORMATION

EXPOSURE #: BB018 (SE-16-006-11W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND GRADING TO SILTY SAND
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
0.0-4.0 M. FINE SAND GRADING TO VERY FINE SILTY SAND AT 3.5 M.

DEPOSIT #011916

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
SE-09-006-11W	180000	20	144000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		144000		

EXPOSURE INFORMATION

EXPOSURE #: RY375 (SE-09-006-11W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: PASTURE,GRAZING
ECONOMIC THICKNESS: 3.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLY SAND
SECTION HEIGHT: 3.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 3.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
LARGE PIT IN MIDDLE OF DAIRY FARM, PIT USED BY MUNICIPALITY FOR PIT RUN, NO PROCESSING, ACTIVE PIT, POOR QUALITY.
3.0 M. PEBBLE SAND, OCCASIONAL BOULDER, PEBBLES HAVE CARBONATE INCRUSTATIONS, MASSIVE TO POORLY BEDDED.

SIEVE ANALYSIS

	PERCENT PASSING											
	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SE-09-006-11W RY375 A	100	100	97	90	77	61	39	20	12	9	7	SPARSE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY375	3	0	6	91	93	SHALE 4.7-9.5 MM.=78%

DEPOSIT #011917

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-32-005-11W	330000	30	231000	PRIVATE/PRIVATE	
SW-05-006-11W	225000	0	225000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		456000		

EXPOSURE INFORMATION

EXPOSURE #: RY376 (SW-05-006-11W) VISITED: 89
EXPOSURE TYPE: BORROW PIT LAND USE: PIT USED TEMPORARILY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 1.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLY GRAVEL
SECTION HEIGHT: 5.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 1.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
SMALL BORROW PIT, 20 CU. M. REMOVED, 0.0-1.0 M. FINE SAND,HORIZONTAL BEDDED
RIVER TERRACE. 1.0-2.0 M. PEBBLE GRAVEL, MASSIVE, SHALE RICH
2.0-5.0 M. FINE SAND

EXPOSURE #: RY591 (SW-05-006-11W) VISITED: 89
EXPOSURE TYPE: HAND DUG HOLE LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 0.5 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: SILTY FINE SAND,PEBBLE FREE
SECTION HEIGHT: 0.5 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SW-05-006-11W RY376 A		100	97	89	69	49	36	26	18	12	9	8	SPARSE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY376	7	0	3	90	88	SHALE 4.7-9.5 MM.= 77%

DEPOSIT #011918 (ASSUMED DEPOSIT)

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-32-005-11W	102000	0	102000	PRIVATE/PRIVATE	
SE-05-006-11W	28000	0	28000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		130000		

DEPOSIT #011919

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-32-005-11W	12000	0	12000	PRIVATE/PRIVATE	
SE-05-006-11W	9000	0	9000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		21000		

EXPOSURE INFORMATION

EXPOSURE #: RY592 (NE-32-005-11W)VISITED:89
EXPOSURE TYPE: HAND DUG HOLE LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 0.5 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: MEDIUM SAND, OCCASIONAL GRANULE
SECTION HEIGHT: 0.5 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
ROADCUT/HAND DUG HOLE ON CREST
OF HILL.

DEPOSIT #011920 (ASSUMED DEPOSIT)

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-32-005-11W	11000	40	6600	PRIVATE/PRIVATE	
SW-32-005-11W	6000	0	6000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		12600		

DEPOSIT #011921 (ASSUMED DEPOSIT)

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
SW-32-005-11W	91500	10	82350	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		82350		

DEPOSIT #011922 (ASSUMED DEPOSIT)

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
SW-30-005-11W	6000	60	2400	CROWN(FEDERAL)/CROWN	
	DEPOSIT RESERVES		2400		

DEPOSIT #011923

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-19-005-11W	1600	0	1600	CROWN(FEDERAL)/CROWN	
NW-19-005-11W	11200	0	11200	CROWN(FEDERAL)/CROWN	
SE-30-005-11W	6400	0	6400	CROWN(FEDERAL)/CROWN	
SW-30-005-11W	15200	40	9120	CROWN(FEDERAL)/CROWN	
	DEPOSIT RESERVES		28320		

EXPOSURE INFORMATION

EXPOSURE #: BB025 (NW-19-005-11W)
EXPOSURE TYPE: BACKHOE TEST PIT
ECONOMIC THICKNESS: 1.0 METRES
SECTION: A
SECTION HEIGHT: 4.0 M.
HEIGHT SAMPLED: 0.0 M.
MATERIAL AT BASE: SILT
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION:
UPPER 1.0 M. ECONOMIC.

VISITED: 89
LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE.HAYING
QUALITY: MEDIUM LOW
MATERIAL DESCRIPTION: GRAVEL VENEER OVER SILTY-FINE SAND
DEPTH TO WATER TABLE:
THICKNESS OF OVERBURDEN :

GENERAL STRATIGRAPHY:
0.0-1.0 M. PEBBLE GEAVEL
1.0-2.0 M. SILT, PEBBLE FREE
2.0-2.5 M. FINE SAND,OCCASIONAL PEBBLE
2.5-3.0 M. SILT
3.0-3.5 M. FINE SAND
3.5-4.0 M. INTERBEDDED VERY FINE SAND & SILT

EXPOSURE #: RY390 (SW-30-005-11W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT NOT IN USE
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 0.7 METRES QUALITY: MEDIUM
SECTION: A MATERIAL DESCRIPTION: PEBBLE GRAVEL
SECTION HEIGHT: 3.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.7 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SILT
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION:
UPPER 0.7 M. ECONOMIC.
GENERAL STRATIGRAPHY:
0.0-0.7 M. PEBBLE GRAVEL, PEBBLES WEATHERED & INCRUSTED
0.7-3.0 M. SANDY SILT, OCCASIONAL SAND BED.

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SW-30-005-11W RY390 A		100	99	94	78	65	52	37	25	13	8	6	SPARSE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY390	0	78	0	22	23	SHALE 4.7-9.5 MM.= N/A

DEPOSIT #011924

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER (SURFACE/GRAVEL)
SW-05-005-11W	144000	85	21600	CROWN(FEDERAL)/CROWN	
	DEPOSIT RESERVES		21600		

EXPOSURE INFORMATION

EXPOSURE #: RY381 (SW-17-005-11W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-NOT IN USE (COMMONLY REVEGETATED)
SURROUNDING LAND USE: PASTURE,GRAZING
ECONOMIC THICKNESS: 3.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: GRAVEL
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND AND GRAVEL
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION:
PIT ON SWAN LAKE RESERVE, 99% SHALE RICH GRAVEL, BORROW PIT
GENERAL STRATIGRAPHY:

DEPOSIT #011925

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER (SURFACE/GRAVEL)
NE-09-005-11W	540000	20	432000	CROWN(FEDERAL)/CROWN	
NE-10-005-11W	945000	0	945000	CROWN(FEDERAL)/CROWN	
NW-10-005-11W	384000	0	384000	CROWN(FEDERAL)/CROWN	
NE-14-005-11W	93000	0	93000	CROWN(FEDERAL)/CROWN	
NW-14-005-11W	1905000	20	1524000	CROWN(FEDERAL)/CROWN	
SW-14-005-11W	1410000	10	1269000	CROWN(FEDERAL)/CROWN	
NE-15-005-11W	1920000	15	1632000	CROWN(FEDERAL)/CROWN	
NW-15-005-11W	1920000	15	1632000	CROWN(FEDERAL)/CROWN	
SE-15-005-11W	1920000	15	1632000	CROWN(FEDERAL)/CROWN	
SW-15-005-11W	1920000	15	1632000	CROWN(FEDERAL)/CROWN	
NE-16-005-11W	1920000	10	1728000	CROWN(FEDERAL)/CROWN	
NW-16-005-11W	1920000	10	1728000	CROWN(FEDERAL)/CROWN	
SE-16-005-11W	1845000	15	1568250	CROWN(FEDERAL)/CROWN	
SW-16-005-11W	810000	5	769500	CROWN(FEDERAL)/CROWN	
NE-17-005-11W	1920000	5	1824000	CROWN(FEDERAL)/CROWN	
NW-17-005-11W	1845000	5	1752750	CROWN(FEDERAL)/CROWN	
SE-17-005-11W	621000	20	496800	CROWN(FEDERAL)/CROWN	
SW-17-005-11W	39000	90	3900	CROWN(FEDERAL)/CROWN	
NE-18-005-11W	570000	0	570000	CROWN(FEDERAL)/CROWN	
NW-18-005-11W	870000	0	870000	CROWN(FEDERAL)/CROWN	
NE-19-005-11W	2030000	5	1928500	CROWN(FEDERAL)/CROWN	
NW-19-005-11W	1855000	0	1855000	CROWN(FEDERAL)/CROWN	
SE-19-005-11W	2240000	0	2240000	CROWN(FEDERAL)/CROWN	
SW-19-005-11W	2240000	5	2128000	CROWN(FEDERAL)/CROWN	
NE-20-005-11W	2240000	10	2016000	CROWN(FEDERAL)/CROWN	
NW-20-005-11W	2240000	5	2128000	CROWN(FEDERAL)/CROWN	
SE-20-005-11W	2240000	2	2195200	CROWN(FEDERAL)/CROWN	
SW-20-005-11W	2240000	5	2128000	CROWN(FEDERAL)/CROWN	
NE-21-005-11W	1920000	5	1824000	CROWN(FEDERAL)/CROWN	
NW-21-005-11W	1920000	5	1824000	CROWN(FEDERAL)/CROWN	
SE-21-005-11W	1920000	15	1632000	CROWN(FEDERAL)/CROWN	
SW-21-005-11W	1920000	5	1824000	CROWN(FEDERAL)/CROWN	
NE-22-005-11W	420000	10	378000	CROWN(FEDERAL)/CROWN	
NW-22-005-11W	1920000	15	1632000	CROWN(FEDERAL)/CROWN	
SE-22-005-11W	360000	5	342000	CROWN(FEDERAL)/CROWN	
SW-22-005-11W	1920000	7	1785600	CROWN(FEDERAL)/CROWN	
NE-23-005-11W	1410000	20	1128000	CROWN(FEDERAL)/CROWN	
NW-23-005-11W	1785000	15	1517250	CROWN(FEDERAL)/CROWN	
SE-23-005-11W	129000	0	129000	CROWN(FEDERAL)/CROWN	
SW-23-005-11W	570000	20	456000	CROWN(FEDERAL)/CROWN	
NW-24-005-11W	12000	80	2400	PRIVATE/PRIVATE	
NW-26-005-11W	1656000	0	1656000	PRIVATE/PRIVATE	
SE-26-005-11W	150000	0	150000	PRIVATE/PRIVATE	
SW-26-005-11W	1530000	5	1453500	PRIVATE/PRIVATE	
NE-27-005-11W	2560000	0	2560000	PRIVATE/PRIVATE	
NW-27-005-11W	2560000	10	2304000	PRIVATE/PRIVATE	
SE-27-005-11W	2080000	0	2080000	CROWN(FEDERAL)/CROWN	
SW-27-005-11W	2560000	10	2304000	CROWN(FEDERAL)/CROWN	
NE-28-005-11W	1920000	15	1632000	PRIVATE/PRIVATE	

NW-28-005-11W	1920000	0	1920000	PRIVATE/PRIVATE
SE-28-005-11W	1920000	0	1920000	CROWN(FEDERAL)/CROWN
SW-28-005-11W	1920000	0	1920000	CROWN(FEDERAL)/CROWN
NE-29-005-11W	2560000	15	2176000	PRIVATE/PRIVATE
NW-29-005-11W	1584000	0	1584000	PRIVATE/PRIVATE
SE-29-005-11W	2560000	0	2560000	PRIVATE/PRIVATE
SW-29-005-11W	1920000	15	1632000	PRIVATE/PRIVATE
SE-30-005-11W	345000	0	345000	CROWN(FEDERAL)/CROWN
SE-32-005-11W	1580000	0	1580000	PRIVATE/PRIVATE
SW-32-005-11W	350000	0	350000	PRIVATE/PRIVATE
SE-33-005-11W	560000	5	532000	PRIVATE/PRIVATE
SW-33-005-11W	700000	10	630000	PRIVATE/PRIVATE
NE-34-005-11W	340000	0	340000	PRIVATE/PRIVATE
SE-34-005-11W	1160000	0	1160000	PRIVATE/PRIVATE
SW-34-005-11W	260000	15	221000	PRIVATE/PRIVATE
NW-35-005-11W	840000	0	840000	PRIVATE/PRIVATE
SW-35-005-11W	729000	20	583200	PRIVATE/PRIVATE
NE-13-005-12W	240000	0	240000	PRIVATE/PRIVATE
NE-24-005-12W	375000	0	375000	PRIVATE/PRIVATE
SE-24-005-12W	780000	5	741000	PRIVATE/PRIVATE
	DEPOSIT RESERVES		89367850	

EXPOSURE INFORMATION

EXPOSURE #: BB021 (NW-28-005-11W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND PEBBLE FREE
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 1.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
0.0-1.5 M. SOIL
1.5-4.0 M. FINE SAND, NO BEDDING

EXPOSURE #: BB022 (SE-32-005-11W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND PEBBLE FREE
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

EXPOSURE #: BB023 (NE-29-005-11W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: SILTY FINE SAND OVER FINE SAND
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
0.0-0.5 M. SOIL
0.5-2.5 M. SILTY FINE SAND
2.5-4.0 M. VERY FINE SAND, UNECONOMIC

EXPOSURE #: BB026 (SW-19-005-11W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 3.5 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND PEBBLE FREE
SECTION HEIGHT: 3.5 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
SITE 300 M. NORTH OF HIGHWAY 23.

EXPOSURE #: RY343 (NE-13-005-12W) VISITED: 88
EXPOSURE TYPE: BORROW PIT LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 3.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLE GRAVEL
SECTION HEIGHT: 3.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 3.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
BORROW PIT, REHABILITATED IN 1989 0.0-0.5 M. SOIL
(SLOPED), 50 CU. REMOVED, HIGH SHALE. 0.5-1.0 M. MASSIVE PEBBLE GRAVEL
1.0-3.0 M. HORIZONTAL BEDDED PEBBLE GRAVEL.

EXPOSURE #: RY449 (SW-35-005-11W) VISITED: 89
EXPOSURE TYPE: HAND/POWER AUGER HOLE LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 0.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: SILTY SAND
SECTION HEIGHT: 1.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

EXPOSURE #: RY450 (NW-18-005-11W) VISITED: 89
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 2.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: COARSE SAND SHALE RICH
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND AND GRAVEL
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

EXPOSURE #: RY593 (NW-28-005-11W) VISITED: 89
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 3.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE-MED. SAND
SECTION HEIGHT: 3.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

SIEVE ANALYSIS

		PERCENT PASSING										
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NE-13-005-12W RY343		100	88	71	65	56	43	30	20	14	11	9	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

DEPOSIT #011926

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-32-006-10W	84000	80	16800	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		16800		

EXPOSURE INFORMATION

EXPOSURE #: RY371 (NW-32-006-10W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT NOT IN USE
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 7.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLE SAND
SECTION HEIGHT: 7.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
5000 CU. M. REMOVED,PIT TOO
OVERGROWN FOR SAMPLE

DEPOSIT #011927

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-26-006-10W	71500	20	57200	PRIVATE/PRIVATE	
NE-27-006-10W	395000	55	177750	PRIVATE/PRIVATE	
NW-27-006-10W	235000	0	235000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		469950		

EXPOSURE INFORMATION

EXPOSURE #: BB033 (NW-26-006-10W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 5.0 METRES QUALITY:
SECTION: A MATERIAL DESCRIPTION: FINE SAND OVER PEBBLE GRAVEL
SECTION HEIGHT: DEPTH TO WATER TABLE: 3.2 M.
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE:
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
BACKHOE TEST PIT IN BASE OF PIT AT RY389.
0.0-1.0 M. FINE SAND, OCCASIONAL PEBBLE
1.0-2.5 M. SILT & VERY FINE SAND
2.5-3.2 M. COARSE SAND
3.2-4.0 M. COARSE PEBBLE GRAVEL, WATER AT 3.2 M.

EXPOSURE #: RY388 (NE-27-006-10W)VISITED:89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT NOT IN USE
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 5.0 METRES QUALITY: MEDIUM
SECTION: A MATERIAL DESCRIPTION: SAND AND GRAVEL
SECTION HEIGHT: 5.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 5.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND AND GRAVEL
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
PIT VARIABLE GRADING FROM SAND TO GRAVEL, OVERGROWN & INACTIVE, 10,000 CU. M. REMOVED, PIT 80 M. X 25 M.

EXPOSURE #: RY389 (NW-26-006-10W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 2.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLY SAND
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
PIT JUST OPENED 1989

SIEVE ANALYSIS

		PERCENT PASSING										
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NE-27-006-10W RY388		98	94	84	66	57	48	40	30	18	11	9	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY388	31	46	1	22	14	SHALE 4.7-9.5 MM.= 57%

DEPOSIT #011928

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-19-006-10W	460000	5	437000	PRIVATE/PRIVATE	
SW-30-006-10W	84000	99	840	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		437840		

EXPOSURE INFORMATION

EXPOSURE #: BB029 (NW-19-006-10W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: MEDIUM LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLE GRAVEL
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE: 3.5 M.
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND AND GRAVEL
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
HOLE IN BASE OF EXISTING PIT, SAME
MATERIAL AS IN PIT WALL.

EXPOSURE #: RY370 (NW-19-006-10W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 5.0 METRES QUALITY: MEDIUM
SECTION: A MATERIAL DESCRIPTION: PEBBLE GRAVEL
SECTION HEIGHT: 5.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 5.0 M. THICKNESS OF OVERBURDEN : 0.3 M.
MATERIAL AT BASE: SAND AND GRAVEL
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
50 CU. M. REMOVED, GOOD QUALITY PIT,
LOW SHALE ,

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NW-19-006-10W RY370		100	98	86	74	61	48	35	24	14	10	8	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY370	91	4	0	5	N/A	SHALE 4.7-9.5 MM.= N/A

DEPOSIT #011929

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-18-006-10W	42000	0	42000	PRIVATE/PRIVATE	
SW-19-006-10W	707000	10	636300	PRIVATE/PRIVATE	
SE-24-006-11W	12000	0	12000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		690300		

EXPOSURE INFORMATION

EXPOSURE #: BB032 (SW-19-006-10W) VISITED: 89

EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY

SURROUNDING LAND USE: AGRICULTURE,HAYING

ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW

SECTION: A MATERIAL DESCRIPTION: PEBBLY COARSE SAND

SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:

HEIGHT SAMPLED: 2.0 M. THICKNESS OF OVERBURDEN :

MATERIAL AT BASE: SAND

SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS

ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

0.0-1.5 M. VERY FINE SAND

1.5-3.5 M. PEBBLY COARSE SAND

3.5-4.0 M. FINE SAND

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SW-19-006-10W BB032		100	100	99	96	90	78	63	44	26	14	10	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
BB032	24	48	0	28	40	SHALE 4.7-9.5 MM.= N/A

DEPOSIT #011930

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-18-006-10W	14000	0	14000	PRIVATE/PRIVATE	
NW-18-006-10W	204000	2	199920	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		213920		

EXPOSURE INFORMATION

EXPOSURE #: RY373 (NW-18-006-10W)
EXPOSURE TYPE :
ECONOMIC THICKNESS: 0.0 METRES
SECTION: MATERIAL DESCRIPTION:
SECTION HEIGHT:
HEIGHT SAMPLED: 0.0 M.
MATERIAL AT BASE:
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION:
PIT NOT VISITED, NO ACCESS.

VISITED: 89
LAND USE:
SURROUNDING LAND USE:
QUALITY:
DEPTH TO WATER TABLE:
THICKNESS OF OVERBURDEN :
GENERAL STRATIGRAPHY:

DEPOSIT #011931

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-17-006-10W	28000	0	28000	PRIVATE/PRIVATE	
SW-17-006-10W	352000	0	352000	PRIVATE/PRIVATE	
SE-18-006-10W	126000	0	126000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		506000		

EXPOSURE INFORMATION

EXPOSURE #: BB031 (SW-17-006-10W)
EXPOSURE TYPE: BACKHOE TEST PIT
ECONOMIC THICKNESS: 3.5 METRES
SECTION: A MATERIAL DESCRIPTION: SILTY FINE SAND OVER PEBBLE GRAVEL
SECTION HEIGHT: 4.0 M.
HEIGHT SAMPLED: 2.0 M.
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION:

VISITED: 89
LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
QUALITY: LOW
DEPTH TO WATER TABLE:
THICKNESS OF OVERBURDEN : 0.5 M.
GENERAL STRATIGRAPHY:
0.0-0.5 M. SOIL
0.5-1.7 M. BEDDED VERY FINE SAND & SILT
1.7-3.0 M. SANDY PEBBLE GRAVEL
3.0-4.0 M. FINE SAND GRADING TO SILTY FINE SAND
5.0 COARSE-FINE SHALE RICH SAND, UNECONOMIC

EXPOSURE #: RY372 (SW-17-006-10W) VISITED: 89
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 5.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: SAND SHALE RICH
SECTION HEIGHT: 5.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 2.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

EXPOSURE #: RY594 (SE-18-006-10W) VISITED: 89
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 3.5 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE-MED. SAND,OCCASIONAL SILT BED.
SECTION HEIGHT: 3.5 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SW-17-006-10W BB031		100	100	97	93	88	82	78	73	64	53	43	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
BB031	28	49	0	23	17	SHALE 4.7-9.5 MM.= N/A

DEPOSIT #011932

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
SE-03-006-09W	22000	20	17600	PRIVATE/PRIVATE	
SW-03-006-09W	4000	0	4000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		21600		

EXPOSURE INFORMATION

EXPOSURE #:RY394 (SE-03-006-09W)VISITED:89

EXPOSURE TYPE: SAND AND GRAVEL PIT
LAND USE: PIT NOT IN USE
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 2.0 METRES
QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLE SAND
SECTION HEIGHT: 2.0 M.
DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M.
THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION:
GENERAL STRATIGRAPHY:
BORROW PIT ON TOP OF RIDGE, 50 CU. M.
REMOVED,POOR PIT, NO SAMPLE

DEPOSIT #011933 (ASSUMED DEPOSIT)

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-23-005-09W	17000	0	17000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		17000		

DEPOSIT #011934 (ASSUMED DEPOSIT)

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-23-005-09W	35000	0	35000	PRIVATE/PRIVATE	
SE-23-005-09W	12000	0	12000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		47000		

DEPOSIT #011935A

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
SW-13-005-09W	6000	99	60	PRIVATE/PRIVATE	
NE-14-005-09W	3000	0	3000	PRIVATE/PRIVATE	
SE-14-005-09W	112500	10	101250	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		104310		

EXPOSURE INFORMATION

EXPOSURE #: RY398 (SW-13-005-09W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT NOT IN USE
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 1.5 METRES QUALITY: LOW
SECTION: MATERIAL DESCRIPTION: FINE PEBBLE SAND
SECTION HEIGHT: 1.5 M. DEPTH TO WATER TABLE: 1.5 M.
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
FARM DUGOUT.

DEPOSIT #011935B (ASSUMED DEPOSIT)

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-12-005-09W	14000	0	14000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		14000		

DEPOSIT #011936

	INITIAL RESERVES (m3)	PERCENT DEPLETED	REMAINING RESERVES (m3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-32-006-08W	1664000	90	166400	PRIVATE/PRIVATE	
SE-32-006-08W	24000	90	2400	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		168800		

EXPOSURE INFORMATION

EXPOSURE #: RY420 (NE-32-006-08W)VISITED:89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 8.0 METRES QUALITY: MEDIUM
SECTION: A MATERIAL DESCRIPTION: PEBBLE GRAVEL
SECTION HEIGHT: 8.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 5.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND AND GRAVEL
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
SECTION: B MATERIAL DESCRIPTION: PEBBLE GRAVEL
SECTION HEIGHT: 7.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 4.0 M. THICKNESS OF OVERBURDEN : 2.0 M.
MATERIAL AT BASE: SAND AND GRAVEL
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
INACTIVE & PARTIALLY OVERGROWN PIT. 0.0-2.0 M. SILT
2.0-7.0 M. PEBBLE GRAVEL, MASSIVE TO POORLY BEDDED PEBBLE GRAVEL WITH SAND LENS.

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NE-32-006-08W RY420 A		100	99	94	86	77	67	53	36	17	10	9	NONE
NE-32-006-08W RY420 B		100	98	91	77	62	48	33	18	10	8	7	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY420 A	30	43	8	19	11	SHALE 4.7-9.5 MM.= 44%
RY420 B	27	57	7	9	7	SHALE 4.7-9.5 MM.= 64%

DEPOSIT #011937

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-28-006-08W	24000	95	1200	PRIVATE/PRIVATE	
SE-32-006-08W	168000	90	16800	PRIVATE/PRIVATE	
SE-33-006-08W	852000	40	511200	PRIVATE/PRIVATE	
SW-33-006-08W	5550000	80	1110000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		1639200		

EXPOSURE INFORMATION

EXPOSURE #: RY418 (SW-33-006-08W) VISITED: 89

EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT

SURROUNDING LAND USE: AGRICULTURE,HAYING

ECONOMIC THICKNESS: 15.0 METRES QUALITY : MEDIUM HIGH

SECTION: A MATERIAL DESCRIPTION: COARSE PEBBLES

SECTION HEIGHT: 15.0 M. DEPTH TO WATER TABLE:

HEIGHT SAMPLED: 9.0 M. THICKNESS OF OVERBURDEN : 1.5 M.

MATERIAL AT BASE: SAND AND GRAVEL

SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS

SECTION: B MATERIAL DESCRIPTION: SANDY GRAVEL

SECTION HEIGHT: 3.0 M. DEPTH TO WATER TABLE:

HEIGHT SAMPLED: 1.5 M. THICKNESS OF OVERBURDEN :

MATERIAL AT BASE: SAND AND GRAVEL

SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS

SECTION: C MATERIAL DESCRIPTION: PEBBLY SAND

SECTION HEIGHT: 6.0 M. DEPTH TO WATER TABLE:

HEIGHT SAMPLED: 5.0 M. THICKNESS OF OVERBURDEN : 0.5 M.

MATERIAL AT BASE: SAME AS IN PIT WALL

SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS

ADDITIONAL INFORMATION:

SOUTH AND WEST PART OF PIT MUCH SANDIER, STOCKPILES OF SCREENED <1 IN. GRAVEL VARIABLE OVER SHORT DISTANCE FROM GRAVEL TO SAND AND SILTY SAND.

GENERAL STRATIGRAPHY:

0.0-3.0 M. PEBBLY SAND WITH OCCASIONAL COBBLE

3.0-6.0 M. PEBBLY FINE SAND, NO COBBLES

6.0-8.0 M. FINE PEBBLES

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SW-33-006-08W RY418 A		100	95	86	70	54	44	37	32	25	10	8	ABUNDANT
SW-33-006-08W RY418 B		97	95	89	68	55	45	35	24	14	9	7	
SW-33-006-08W RY418 C		100	99	95	88	79	66	52	35	20	14	12	MODERATE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY418 A	33	48	1	17	16	SHALE 4.7-9.5 MM.= N/A
RY418 B	26	55	3	16	15	SHALE 4.7-9.5 MM.= 50%
RY418 C	21	56	5	18	16	SHALE 4.7-9.5 MM.= N/A

DEPOSIT #011938

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-33-006-08W	100000	0	100000	PRIVATE/PRIVATE	
SE-33-006-08W	1000000	30	700000	PRIVATE/PRIVATE	
SW-34-006-08W	12000	95	600	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		800600		

EXPOSURE INFORMATION

EXPOSURE #: RY423 (SW-34-006-08W) VISITED: 89
EXPOSURE TYPE: HAND DUG HOLE LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 0.5 METRES QUALITY: MEDIUM LOW
SECTION: A MATERIAL DESCRIPTION: SANDY GRAVEL
SECTION HEIGHT: 0.5 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE:
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

EXPOSURE #: RY541 (SE-33-006-08W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 10.0 METRES QUALITY : MEDIUM
SECTION: A MATERIAL DESCRIPTION: COARSE PEBBLE GRAVEL
SECTION HEIGHT: 10.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 6.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND AND GRAVEL
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS

SECTION: B MATERIAL DESCRIPTION: SAND & PEBBLE GRAVEL
SECTION HEIGHT: 12.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 6.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE:
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
SAMPLE FROM SOUTH END OF PIT,
SOUTHEAST END OF PIT HAS FINER
MATERIAL INCLUDING SILT NEAR PIT BASE.

SIEVE ANALYSIS

		PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SE-33-006-08W RY541 A		99	93	86	70	57	41	31	24	17	12	10	MODERATE
SE-33-006-08W RY541 B		98	94	87	67	50	33	23	18	13	11	9	MODERATE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY541 B	71	0	5	24	20	SHALE 4.7-9.5 MM.= 23%
RY541 A	77	0	7	16	13	SHALE 4.7-9.5 MM.= 22%

DEPOSIT #011939

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-34-006-08W	420000	0	420000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		420000		

EXPOSURE INFORMATION

EXPOSURE #: BH009 (NW-34-006-08W) VISITED: 87
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
4 M. OXIDIZED FINE SAND, R.M. SOUTH
NORFOLK TEST PIT

DEPOSIT #011940A

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-34-006-08W	600000	0	600000	PRIVATE/PRIVATE	
NW-35-006-08W	920000	0	920000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		1520000		

EXPOSURE INFORMATION

EXPOSURE #: BH010 (NE-35-006-08W) VISITED: 87
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE :
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
R.M. SOUTH NORFOLK TEST PIT,

EXPOSURE #: RY421 (NW-35-006-08W) VISITED: 89
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
HORIZONTAL BEDDED FINE SAND WITH OCCASIONAL GRAVEL LENS.

DEPOSIT #011940B

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-25-006-08W	570000	0	570000	PRIVATE/PRIVATE	
NW-25-006-08W	1920000	0	1920000	PRIVATE/PRIVATE	
SE-25-006-08W	900000	0	900000	PRIVATE/PRIVATE	
SW-25-006-08W	420000	0	420000	PRIVATE/PRIVATE	
NE-26-006-08W	1770000	0	1770000	PRIVATE/PRIVATE	
NW-26-006-08W	111000	0	111000	PRIVATE/PRIVATE	
SE-26-006-08W	270000	0	270000	PRIVATE/PRIVATE	
SE-34-006-08W	66000	0	66000	PRIVATE/PRIVATE	
NE-35-006-08W	1470000	0	1470000	PRIVATE/PRIVATE	
NW-35-006-08W	48000	0	48000	PRIVATE/PRIVATE	
SE-35-006-08W	1920000	0	1920000	PRIVATE/PRIVATE	
SW-35-006-08W	1830000	5	1738500	PRIVATE/PRIVATE	
NW-36-006-08W	33000	0	33000	PRIVATE/PRIVATE	
SW-36-006-08W	870000	0	870000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		12106500		

EXPOSURE INFORMATION

EXPOSURE #: RY417 (SW-25-006-08W) VISITED: 89
EXPOSURE TYPE: HAND DUG HOLE LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 1.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND
SECTION HEIGHT: 1.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
FINE SAND OCCASIONAL PEBBLE.

EXPOSURE #: RY424 (SW-35-006-08W) VISITED: 89
EXPOSURE TYPE: BORROW PIT LAND USE: PIT-TEMPORARY USE
SURROUNDING LAND USE: PASTURE,GRAZING
ECONOMIC THICKNESS: 3.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE-COARSE SAND & GRANULES
SECTION HEIGHT: 3.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 2.0 M. THICKNESS OF OVERBURDEN : 1.0 M.
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
0.0-1.5 M. PEBBLY SILT AND FINE SAND
1.5-3.0 M. HORIZONTAL BEDDED COARSE SAND AND GRANULES, FEW PEBBLES.

EXPOSURE #: RY425(NE-35-006-08W) VISITED: 89
EXPOSURE TYPE: HAND DUG HOLE LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 1.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND
SECTION HEIGHT: 1.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

SIEVE ANALYSIS

		PERCENT PASSING										
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SW-35-006-08W RY424 A		100	100	98	95	88	76	55	25	10	7	6	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY424	18	2	8	71	67	SHALE 4.7-9.5 MM.= N/A

DEPOSIT #011940C

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-24-006-08W	800000	20	640000	PRIVATE/PRIVATE	
SE-25-006-08W	456000	0	456000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		1096000		

EXPOSURE INFORMATION

EXPOSURE #: RY342 (NE-24-006-08W)VISITED:88
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 5.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND
SECTION HEIGHT: 5.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

DEPOSIT #011941

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-25-006-08W	1280000	0	1280000	PRIVATE/PRIVATE	
NE-35-006-08W	440000	1	435600	PRIVATE/PRIVATE	
NE-36-006-08W	28000	0	28000	PRIVATE/PRIVATE	
NW-36-006-08W	2900000	0	2900000	PRIVATE/PRIVATE	
SE-36-006-08W	1840000	5	1748000	PRIVATE/PRIVATE	
SW-36-006-08W	1080000	0	1080000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		7471600		

EXPOSURE INFORMATION

EXPOSURE #: BB039 (NE-25-006-08W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
0.0-0.5 M. SOIL
0.5-2.5 M. SILTY FINE SAND
2.5-4.0 M. FINE SAND, OCCASIONAL PEBBLE

EXPOSURE #: RY426 (NW-36-006-08W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 7.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND
SECTION HEIGHT: 7.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 5.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
200 CU. M. REMOVED, BORROW PIT/SAND PIT, TOO FINE FOR PEBBLE LITHOLOGY OR COARSE GRAIN SIZE, HORIZONTAL BEACH BEDDING.

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NW-36-006-08W RY426 A		100	100	100	99	99	99	98	86	41	18	14	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

DEPOSIT #011942

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-27-006-08W	31500	0	31500	PRIVATE/PRIVATE	
NE-28-006-08W	54000	0	54000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		85500		

EXPOSURE INFORMATION

EXPOSURE #: BB038 (NE-28-006-08W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 1.5 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLE SAND OVER SILTY FINE SAND
SECTION HEIGHT: 3.5 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 1.5 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
0.0-2.0 M. PEBBLE SAND
2.0-3.5 M. SILTY FINE SAND GRADING TO BEDDED SILT AT 4.0 M.

EXPOSURE #: RY429 (NE-28-006-08W) VISITED: 89
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 2.0 METRES QUALITY: MEDIUM LOW
SECTION: A MATERIAL DESCRIPTION: SANDY GRAVEL
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND AND GRAVEL
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

SIEVE ANALYSIS

		PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NE-28-006-08W BB038 A		99	96	91	82	71	58	44	31	20	12	9	SPARSE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
BB038	57	2	13	27	29	SHALE 4.7-9.5 MM.= 52%

DEPOSIT #011943

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-22-006-08W	52000	0	52000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		52000		

EXPOSURE INFORMATION

EXPOSURE #: RY414 (NE-22-006-08W) VISITED: 89
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 2.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: SANDY GRAVEL
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND AND GRAVEL
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

DEPOSIT #011944 (NO MINING WEED CONTROL)

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-24-006-08W	39000	99	390	PRIVATE/PRIVATE	
NW-24-006-08W	500500	99	5005	PRIVATE/PRIVATE	
SW-25-006-08W	8000	99	80	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		5475		

EXPOSURE INFORMATION

EXPOSURE #: RY416 (NW-24-006-08W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: MEDIUM LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLY SAND
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 4.0 M. THICKNESS OF OVERBURDEN : 0.3 M.
MATERIAL AT BASE: SAND AND GRAVEL
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
4000 CU. M. REMOVED, ACTIVE PIT WITH STOCKPILE <1 IN. MATERIAL (100 CU. M.), NO MINING ALLOWED DUE TO WEED CONTROL.
1.0-4.0 M. PEBBLE SAND WITH COBBLES, MASSIVE WITH NO BEDDING

SIEVE ANALYSIS

		PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NW-24-006-08W RY416 A		100	99	94	91	84	76	67	52	31	18	13	SPARSE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY416	18	44	2	36	20	SHALE 4.7-9.5 MM.= N/A

DEPOSIT #011945

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-23-006-08W	525000	5	498750	PRIVATE/PRIVATE	
NW-24-006-08W	1000	0	1000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		499750		

EXPOSURE INFORMATION

EXPOSURE #: RY415 (NE-23-006-08W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT NOT IN USE
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 6.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLY FINE SAND
SECTION HEIGHT: 6.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 3.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
OVERGROWN PIT, INACTIVE, 500 CU. M.
REMOVED,FINE SAND OCCASIONAL
PEBBLE, NO BEDDING.

SIEVE ANALYSIS

		PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NE-23-006-08W RY415 A		100	100	98	96	92	88	82	70	43	18	11	SPARSE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY415	13	48	0	39	N/A	SHALE 4.7-9.5 MM.= N/A

DEPOSIT #011946

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-14-006-08W	12000	0	12000	PRIVATE/PRIVATE	
SE-23-006-08W	8000	0	8000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		20000		

EXPOSURE INFORMATION

EXPOSURE #: BB040 (SE-23-006-08W)
EXPOSURE TYPE: BACKHOE TEST PIT
ECONOMIC THICKNESS: 1.0 METRES
SECTION: A MATERIAL DESCRIPTION: PEBBLE GRAVEL VENEER OVER TILL
SECTION HEIGHT: 4.0 M.
HEIGHT SAMPLED:
MATERIAL AT BASE: SILT
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION:
UNECONOMIC

VISITED: 89
LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
QUALITY: LOW
DEPTH TO WATER TABLE:
THICKNESS OF OVERBURDEN : 0.5 M.

GENERAL STRATIGRAPHY:
0.0-0.5 M. SOIL
0.5-1.5 M. PEBBLE GRAVEL
1.5-4.0 M. SANDY BROWN TILL
4.0 LAMINATED SILT

DEPOSIT #011947

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-15-006-08W	108000	30	75600	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		75600		

EXPOSURE INFORMATION

EXPOSURE #: RY413 (NW-15-006-08W)
EXPOSURE TYPE: SAND AND GRAVEL PIT
ECONOMIC THICKNESS: 6.0 METRES
SECTION: A MATERIAL DESCRIPTION: COARSE GRAVEL
SECTION HEIGHT: 11.0 M.
HEIGHT SAMPLED: 8.0 M.
MATERIAL AT BASE: SAND AND GRAVEL
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION:
PIT ON SIDE OF MELTWATER CHANNEL, DIFFICULT TO MINE DUE TO STEEP SLOPE AND STEEP ACCESS ROAD, CRUSHABLE >6 IN. MATERIAL ON SITE.

VISITED: 89
LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
QUALITY: MEDIUM LOW
DEPTH TO WATER TABLE:
THICKNESS OF OVERBURDEN : 5.0 M.

GENERAL STRATIGRAPHY:
0.0-5.0 M. HORIZONTAL BEDDED SILT AND FINE SAND
5.0-11.0 M. MASSIVE COARSE SAND AND GRAVEL,HIGH SHALE

SIEVE ANALYSIS

		PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NW-15-006-08W RY413 A		92	83	71	52	40	31	23	16	11	8	7	ABUNDANT

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY413	1	59	1	38	26	SHALE 4.7-9.5 MM.= 45%

DEPOSIT #011948

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-04-006-08W	46000	0	46000	PRIVATE/PRIVATE	
NE-05-006-08W	14000	0	14000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		60000		

EXPOSURE INFORMATION

EXPOSURE #: RY409 (NW-04-006-08W) VISITED: 89
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 2.5 METRES QUALITY: MEDIUM LOW
SECTION: A MATERIAL DESCRIPTION: PEBBLE GRAVEL
SECTION HEIGHT: 2.5 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND AND GRAVEL
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

DEPOSIT #011949

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-04-006-08W	69000	0	69000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		69000		

EXPOSURE INFORMATION

EXPOSURE #: RY410 (NW-04-006-08W) VISITED: 89
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: MEDIUM LOW
SECTION: A MATERIAL DESCRIPTION: SANDY GRAVEL
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND AND GRAVEL
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

DEPOSIT #011950

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-32-005-08W	32500	85	4875	PRIVATE/PRIVATE	
SW-05-006-08W	74000	99	740	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		5615		

EXPOSURE INFORMATION

EXPOSURE #: BB044 (SW-05-006-08W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 2.5 METRES QUALITY:
SECTION: A MATERIAL DESCRIPTION: PEBBLE GRAVEL
SECTION HEIGHT: DEPTH TO WATER TABLE: 2.5 M.
HEIGHT SAMPLED: 2.5 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE:
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
HOLE FILLING WITH WATER AT 2.5 M. 0.0-2.5 M. PEBBLE GRAVEL
2.5-3.5 M. CLAY TILL

EXPOSURE #:RY408 (NW-32-005-08W)VISITED:89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 2.0 METRES QUALITY: MEDIUM
SECTION: A MATERIAL DESCRIPTION: COARSE PEBBLES AND SAND
SECTION HEIGHT: 3.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 2.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: BEDROCK
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
5000 CU. M. REMOVED, CLASTS 99% 0.0-1.0 M. SHALE RICH TILL
SHALE, PIT PARTIAL OVERGROWN. 1.0-3.0 M. PEBBLE GRAVEL WITH SAND BEDS.
3.0 SHALE BEDROCK

SIEVE ANALYSIS

		PERCENT PASSING										
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SW-05-006-08W BB044 A		99	93	81	72	59	48	38	28	18	13	12	NONE
NW-32-005-08W RY408 A		100	99	91	84	70	61	53	44	32	22	16	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
RY408	3	4	0	93	N/A	SHALE 4.7-9.5 MM.= N/A
BB044	22	0	0	78	70	SHALE 4.7-9.5 MM.= 77%

DEPOSIT #011951

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-26-005-08W	24000	0	24000	PRIVATE/PRIVATE	
NE-27-005-08W	40000	0	40000	PRIVATE/PRIVATE	
SE-34-005-08W	96000	0	96000	PRIVATE/PRIVATE	
SW-35-005-08W	44000	0	44000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		204000		

EXPOSURE INFORMATION

EXPOSURE #: BB050 (NW-26-005-08W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: MEDIUM
SECTION: A MATERIAL DESCRIPTION: COBBLE PEBBLE GRAVEL OVER TILL
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 2.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: TILL
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
0.0-4.0 M. COBBLY COARSE PEBBLE GRAVEL NO BEDDING
4.0 TILL,GREY

SIEVE ANALYSIS

		PERCENT PASSING										
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NW-26-005-08W BB050 A		94	90	81	75	68	61	54	47	38	26	18	MODERATE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
BB050	87	0	4	8	9	SHALE 4.7-9.5 MM.= N/A

DEPOSIT #011952

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-27-005-08W	10000	0	10000	PRIVATE/PRIVATE	
SW-27-005-08W	2000	0	2000	PRIVATE/PRIVATE	
NE-28-005-08W	162000	0	162000	PRIVATE/PRIVATE	
SE-28-005-08W	180000	40	108000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		282000		

EXPOSURE INFORMATION

EXPOSURE #: RY401 (NE-28-005-08W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 3.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND
SECTION HEIGHT: 3.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 3.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
ACTIVE PIT , VERY FINE SAND,700 CU. M.
REMOVED,3 M. FINE SILTY SAND WITH
10 cm. PEBBLE BEDS.

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NE-28-005-08W RY401 A		100	100	100	99	95	89	82	76	69	54	34	NONE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

DEPOSIT #011953 (ASSUMED DEPOSIT)

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
SE-22-005-08W	31500	0	31500	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		31500		

DEPOSIT #011954

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
SE-22-005-08W	52500	5	49875	PRIVATE/PRIVATE	
SW-23-005-08W	13500	0	13500	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		63375		

EXPOSURE INFORMATION

EXPOSURE #: RY438 (SE-22-005-08W)
EXPOSURE TYPE: BORROW PIT
ECONOMIC THICKNESS: 1.5 METRES
SECTION: A MATERIAL DESCRIPTION: PEBBLY COARSE SAND
SECTION HEIGHT: 1.5 M.
HEIGHT SAMPLED: 0.0 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION:
SMALL BORROW PIT, 20 CU. M. REMOVED,

VISITED: 89
LAND USE: PIT NOT IN USE
SURROUNDING LAND USE: AGRICULTURE,HAYING
QUALITY: LOW
DEPTH TO WATER TABLE:
THICKNESS OF OVERBURDEN : 0.5 M.
GENERAL STRATIGRAPHY:

DEPOSIT #011955

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NE-11-005-08W	679000	0	679000	PRIVATE/PRIVATE	
SE-11-005-08W	17500	0	17500	PRIVATE/PRIVATE	
NW-12-005-08W	80000	0	80000	PRIVATE/PRIVATE	
SW-12-005-08W	660000	30	462000	PRIVATE/PRIVATE	
SE-14-005-08W	24000	0	24000	PRIVATE/PRIVATE	
SW-14-005-08W	255000	0	255000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		1517500		

EXPOSURE INFORMATION

EXPOSURE #: BB051 (SE-14-005-08W)
EXPOSURE TYPE: BACKHOE TEST PIT
ECONOMIC THICKNESS: 4.0 METRES
SECTION: A MATERIAL DESCRIPTION: PEBBLE GRAVEL
SECTION HEIGHT:
HEIGHT SAMPLED: 3.0 M.
MATERIAL AT BASE:
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION:

VISITED: 89
LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
QUALITY:
DEPTH TO WATER TABLE:
THICKNESS OF OVERBURDEN :
GENERAL STRATIGRAPHY:
0.0-0.3 M. PEBBLE GRAVEL
0.3-1.2 M. PEBBLY SILT
1.2-4.0 M. SANDY PEBBLE GRAVEL WITH OCCASIONAL SAND LENS

EXPOSURE #: RY403 (SW-12-005-08W) VISITED: 89
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: MEDIUM LOW
SECTION: A MATERIAL DESCRIPTION: SAND AND GRAVEL
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 4.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
SERIES 4 SMALL PITS ALONG RIDGE OF HILL, 20,000 CU. M. REMOVED,PITS INACTIVE AND PARTIALLY OVERGROWN, MODERATE 6 IN. MATERIAL BUT GRAVEL HAS HIGH SHALE,MASSIVE GRAVEL,.

EXPOSURE #: RY404 (NE-11-005-08W) VISITED: 89
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 3.0 METRES QUALITY: MEDIUM LOW
SECTION: A MATERIAL DESCRIPTION: SANDY GRAVEL
SECTION HEIGHT: 3.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.3 M.
MATERIAL AT BASE: SAND AND GRAVEL
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
SE-14-005-08W BB051 A		100	99	95	89	82	75	66	56	42	25	16	SPARSE
SW-12-005-08W RY403 A		98	96	91	89	85	78	70	61	48	31	23	MODERATE

(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
BB051	72	3	10	15	10	SHALE 4.7-9.5 MM.= N/A
RY403	10	52	4	35	31	SHALE 4.7-9.5 MM.= N/A

DEPOSIT #011956

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-10-006-11W	112000	0	112000	PRIVATE/PRIVATE	
SW-15-006-11W	245000	0	245000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		357000		

EXPOSURE INFORMATION

EXPOSURE #: BB019 (NW-10-006-11W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: VERY FINE SAND WITH CLAY
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.5 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
0.0-0.5 M. SOIL
0.5-3.5 M. VERY FINE CLAYEY SAND GRADING TO CLEAN FINE SAND AT 4.0 M.

EXPOSURE #: RY439 (NW-10-006-11W) VISITED: 89
EXPOSURE TYPE: HAND DUG HOLE LAND USE: AGRICULTURE,HAYING
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 0.5 METRES QUALITY: LOW
SECTION: A MATERIAL DESCRIPTION: FINE SAND PEBBLE FREE
SECTION HEIGHT: 0.5 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 0.0 M. THICKNESS OF OVERBURDEN : 0.3 M.
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

DEPOSIT #011957

	INITIAL RESERVES (m^3)	PERCENT DEPLETED	REMAINING RESERVES (m^3)	OWNER (SURFACE/GRAVEL)	OWNER 2 (SURFACE/GRAVEL)
NW-29-005-11W	66000	0	66000	PRIVATE/PRIVATE	
SW-32-005-11W	36000	0	36000	PRIVATE/PRIVATE	
	DEPOSIT RESERVES		102000		

EXPOSURE INFORMATION

EXPOSURE #: BB024 (NW-29-005-11W) VISITED: 89
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY OR ROADWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 4.0 METRES QUALITY: MEDIUM
SECTION: A MATERIAL DESCRIPTION: COBBLY PEBBLE GRAVEL
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
HEIGHT SAMPLED: 3.0 M. THICKNESS OF OVERBURDEN :
MATERIAL AT BASE: SAND AND GRAVEL
SEE SIEVE ANALYSIS AND PETROGRAPHIC ANALYSIS
ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:
ANGULAR SHALE COBBLES AT 2.5 M., ROADCUT :
HIGH SHALE CONTENT. 0.0-4.0 M. COARSE SAND
BACKHOE :
4.0-8.0 M. COBBLY PEBBLE GRAVEL

EXPOSURE #: RY377 (NW-29-005-11W) VISITED: 89

EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY OR ROADWAY

SURROUNDING LAND USE: AGRICULTURE,HAYING

ECONOMIC THICKNESS: 4.0 METRES QUALITY: LOW

SECTION: A MATERIAL DESCRIPTION: MEDIUM SAND

SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:

HEIGHT SAMPLED: THICKNESS OF OVERBURDEN : 0.5 M.

MATERIAL AT BASE: SAND

NO CHANNEL SAMPLE TAKEN

ADDITIONAL INFORMATION: GENERAL STRATIGRAPHY:

MED. SAND GRADING TO COARSER SAND

AT 4.0 M. OCCASIONAL PEBBLE AT 4.0 M.

SIEVE ANALYSIS

	PERCENT PASSING											
	OVERSIZED	3.0	1.5	3/4	3/8	#4	#8	#16	#30	#50	#100	#200	(PLUS 6")
NW-29-005-11W BB024 A		91	84	75	73	70	65	53	28	18	16	14	NONE

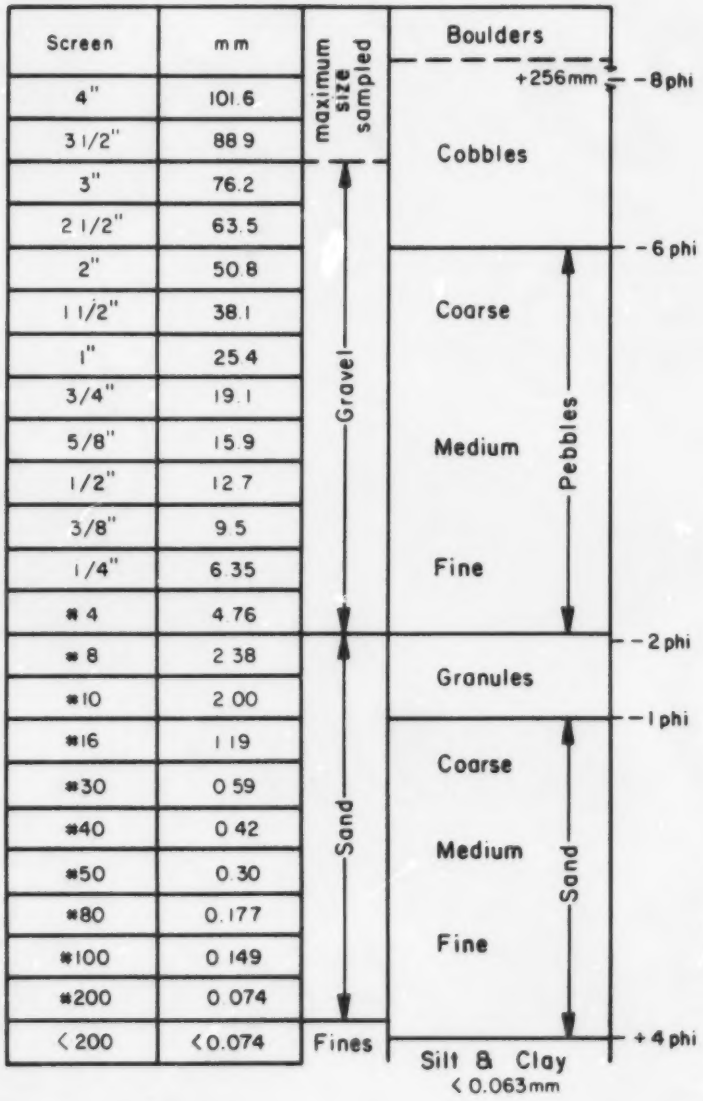
(NOTE: ALL SAMPLES ARE 100% PASSING 6 INCHES)

PETROGRAPHIC ANALYSIS(19.1-38.1 mm.)

SAMPLE	% GOOD	% FAIR	% POOR	% DELETERIOUS	% SHALE (BY WEIGHT)	COMMENTS
BB024	19	0	0	81	86	SHALE 4.7-9.5 MM.= N/A

TOTAL REPORT RESERVES 124652855

APPENDIX B: GRAIN SIZE CLASSIFICATION



APPENDIX C: GLOSSARY

AGGREGATE

Any inert, construction material (sand, gravel, slag, crushed stone or other mineral material).

AGGREGATE RESERVES

Aggregate in a deposit which is proven and is economically signficiant.

ALLUVIUM

Alluvium is a general term for clay, silt, sand, gravel, or similar unconsolidated material deposited during postglacial time by a stream.

BEACH DEPOSITS

These are relatively narrow, linear features formed at the shores of glacial lakes that existed during deglaciation. Well developed beaches are usually less than 20 feet (6 m) thick. The aggregate is well sorted and stratified and sand-sized material commonly predominates.

BEDROCK

In-place pre-Quaternary material exposed at the surface or underlying the surficial material.

BINDER

Material that produces or promotes consolidation in loosely aggregated sediments. Usually mud or clay, sometimes till is used for binder.

CARBONATE ROCKS

A broad term referring to those sedimentary rocks consisting chiefly of carbonate minerals, mainly limestone and dolostone.

CLAST

An individual constituent, grain, or fragment of a sediment or rock, produced by the mechanical weathering of a large rock mass. Synonyms include particle and fragment.

CROWN LAND

Land reserved and administered by the Crown. Sand and gravel usually administered by the Crown.

CROWN SAND AND GRAVEL

Sand and gravel reserved and administered by the Crown.

DELETERIOUS LITHOLOGY

A general term used to designate those rock types which are chemically or physically unsuited for use as construction or road-building aggregates. Such lithologies as chert, shale, siltstone, and sandstone may deteriorate rapidly.

DEPOSIT

An accumulation of sediments left in a new location by a natural transportative agent such as water, wind, ice, or gravity.

An aggregate deposit is a deposit of sand and gravel considered to be of economic significance.

DIRT

See fines.

DOLOMITE (DOLOSTONE)

A carbonate sedimentary rock consisting chiefly of the mineral dolomite and containing relatively little calcite (dolomite is also known as dolostone).

DRIFT

A general term for all unconsolidated rock debris transported from one place and deposited in another; distinguished from underlying bedrock. In North America, glacial activity has been the dominant mode of transport and deposition of drift. Synonyms include overburden and surficial deposit.

DURABLE ROCK

A rock fragment which is hard and inert and can be used as aggregate without breaking, crumbling or reacting with the cementing material.

EOLIAN

Pertaining to wind action.

EPOCH

A geological-time unit longer than an age and a subdivision of a period.

ESKERS

Eskers are narrow, sinuous ridges of sand and gravel. They vary greatly in size. Many eskers consist of a central core of poorly sorted and stratified gravel. The core material is often draped by better sorted and stratified sand and gravel.

FINES

A general term used to describe the size fraction of an aggregate which passes (is finer than) the No. 200 mesh screen (0.074 mm). Also described informally as "dirt", these particles are in the silt- and clay-size range.

FLUVIAL

Pertaining to rivers or streams.

GLACIOFLUVIAL DEPOSITS

Material deposited by streams flowing from, on, or within melting glacier ice, generally composed of sorted, stratified sand and gravel; includes outwash, kame, esker, etc.

GLACIOLACUSTRINE DELTAS

These features were formed where streams or rivers of glacial meltwater flowed into lakes and deposited their suspended sediment. Such deposits tend to consist mainly of sand and abundant silt. However, in near-ice or ice-contact positions, coarse material may be present.

GLACIOLACUSTRINE DEPOSITS

Material deposited in lakes affected by glacier ice or by meltwater flowing directly from glaciers; composed of well-sorted clay, silt, or sand.

GRANULAR BASE COURSE

Components of a road placed on subgrade and designed to provide strength, stability, and drainage, as well as support for surfacing materials. Several types have been defined: Granular Base Course A consists of crushed and processed aggregate and has relatively stringent quality standards in comparison to Granular Base Course B and C which are usually pit-run or other unprocessed aggregate.

GROUND MORAINE

A deposit of till with a flat or undulating surface.

HOLOCENE

An epoch of the Quaternary period covering the time period from the retreat of the continental glaciers to the present, about 10 000 years.

HUMMOCKY

An irregular or knob and kettle surface.

HUMMOCKY MORAINE

A landscape composed primarily of till with a hummocky surface.

ICE-CONTACT DEPOSIT

Material deposited in contact with glacier ice by meltwater; includes kames, eskers, kame terraces, etc.

ICE-CONTACT TERRACES

These are glaciofluvial features deposited between the glacial margin and a confining topographic high, such as the side of a valley. The structure may be similar to outwash deposits.

KAMES

Kames are mounds of poorly sorted sand and gravel deposited by meltwater in depressions or fissures on the ice surface or at its margin. The deposits consist mainly of irregularly bedded and cross-bedded, poorly sorted sand and gravel. Deposits include single mounds, linear ridges (crevasse fillings) or complex groups of landforms.

LACUSTRINE DEPOSIT

Material deposited in a lake.

LITHOLOGY

The description of rocks on the basis of such characteristics as color, structure, mineralogic composition, and grain size. Generally, the description of the physical character of a rock.

MELTWATER CHANNEL

A drainage way produced by water flowing away from a melting glacier margin.

MORAINE

A distinct accumulation of glacial drift. Could represent an ice marginal position.

OUTWASH

Outwash deposits consist of sand and gravel laid down by meltwaters beyond the margin of the ice lobes. They occur as sheets or as terraced valley fills (valley trains) and may be very large in extent and thickness. Well developed outwash deposits have good horizontal bedding and are uniform in grain-size distribution. Outwash deposited near the glacier's margin is much more variable in texture and structure.

PIT RUN

Unprocessed aggregate removed from pit. Generally consists of fine pebble gravel with minor amounts of material coarser than 38 mm (1 1/2"). It is used for road maintenance, upgrading and resurfacing.

PLEISTOCENE

An epoch of the recent geological past including the time from approximately 1.8 million years ago to 10 000 years ago. Much of the Pleistocene was characterized by extensive glacial activity.

QUATERNARY

The second period of the Cenozoic era, thought to cover the last 2-3 million years. It consists of two epochs: The Pleistocene and the Holocene.

RESOURCE

An aggregate deposit or environment which may or may not be proven and is presently not economically significant.

SHALE

A fine-grained, sedimentary rock formed by the consolidation of clay, silt, or mud and characterized by well developed bedding planes, along which the rock breaks readily into thin layers. The term shale is also commonly used for fissile claystone, siltstone, and mudstone.

SPILLWAY

Large drainage valley formed by meltwater flowing from a glacial lake. Spillways often have gravel terraces.

STONE

That component of aggregate coarser than 4.76 mm or the #4 sieve, includes pebbles, cobbles and boulders.

SURFICIAL GEOLOGY

A form of geological mapping dealing with all materials occurring at surface in an area: unlithified or lithified (sediments or bedrock).

TERRACE

A relatively flat, stair-stepped, depositional or erosional surface bounded by an ascending slope on one side and a descending slope on the other.

TILL

Unsorted and unstratified rock debris, deposited directly by glaciers, and ranging in size from clay to large boulders.

WISCONSINAN

Pertaining to the last glacial stage of the Pleistocene Epoch in North America. It began approximately 100 000 years ago and ended approximately 10 000 years ago. The glacial deposits and landforms of southern Manitoba are predominantly the result of glacial activity during the Winsconsinan Stage.

MAPS
NOT
FILMED

CARTES
OMISES